CHAPTER 3

OVERVIEW OF TM 5-301, TM 5-302, TM 5-303, AND THE TACAPS USER GUIDE

3-1. GENERAL

This chapter explains the purpose and content of each of the AFCS manuals. Also, for those who are not engineers, a brief section is included on the use of construction drawings. Furthermore, since some new and typical AFCS designs will contain a critical path method (CPM) network, a brief section describing CPM and how it can be used to control actual construction is provided.

3-2. USE OF TM 5-301

a. Purpose. TM 5-301 is a planning document that provides material costs and logistical and engineering data needed to plan theater construction. TM 5-301 is intended for use by those listed in paragraphs *(1)* through *(3)* below:

(1) Contingency, base development, construction, and logistical planners.

(2) Construction units (since the manual contains the engineering data required for construction of the various structures, facilities, installations, and utilities required by the Army and Air Force for the support of military missions in the theater).

(3) Logistical commands and supply agencies for requisitioning, identifying, costing, and other related supply functions.

b. Installation Planning Tables. The term "planning tables" describes data published in TM 5-301 under the category of installations or facilities. (See figure 3-1 for an example of an installation planning table.) Installations are shown in the ascending order by the installation number in the upper right-hand corner, which consists of two alpha and four numeric characters (such as AR1511). The number identifies the complete BOM required to construct that installation. The installation description appears in the upper left-hand corner and includes the title, standard and type of construction, purpose, and other information as needed. The tables contain the items listed in paragraphs *(1)* through *(9)* below, which coordinate with the circled numbers in figure 3-1:

(1) Drawing Number. TM 5-302, volume 1, contains the installation drawings, which are listed in the alphanumeric sequence by installation numbers.

(2) Facility Number. Five numeric and two alpha characters identifying each AFCS facility (such as 21410BW). The five numeric characters are the construction category codes from AR 415-28.

(3) Facility Description. A brief description of the facilities included in the installation.

(4) Size or Unit. Dimensions, capacity, or unit of measure for each installation facility.

(5) Basis. The criteria or standard planning basis on which facilities are included in the installation.

(6) Quantity Required. The quantity needed of a particular installation facility.

(7) Materials. The total materials, logistics, and cost data associated with the number of facilities. Weight is shown in short tons (ST) (2,000 pounds) and volume in measured tons (MT) (40 cubic feet per measured ton).

(8) Construction Man-Hours. The estimated horizontal, vertical, and general construction man-hours.

(9) Installation Totals. The materials, logistics, and cost data and the construction effort totals shown at the end of each table. (Note that costs listed are current only at the time of publication.)

c. Facility Planning Tables. Another feature of TM 5-301 is the facility planning tables (see figure 3-2 for an example). AFCS facilities are identified by their application in a TO. The tables contain the items listed in paragraphs *(1)* through *(4)* below, which coordinate with the circled numbers in figure 3-2:

(1) Facility Number. Five numeric and two alpha characters that identify each facility (such as 41180AG). The TM 5-302 numbering system uses the entire facility number for the corresponding construction drawing; however, there is not a drawing for every facility number.

(2) Description. A detailed description of each facility. TM 5-303 provides a detailed BOM for each facility; TM 5-302 provides construction drawings and drawings for utilities (electric, sewage, and water).

TM 5-301

TROPIC CLIMATE MT2028

Vehicle maintenance installation for all levels of support through general support activities. Consist of 20 bays and shop area for off vehicle repair. Temporary standard in the tropic/desert climates, wood buildings.

FAC NUMBER	FACILITY DESCRIPTION	SIZE OR UNIT	BASIS	QUANTITY REQUIRED	MATERIALS			CONSTR EFFORT IN MAN-HOURS			
					WT-ST	VOL-MT	COST	HORZ	VERT	GENL	TOT
21410BW	TRACKED VEH TURNING PAD		AS REQUIRED	31.4	628	471	41197		1411	2140	3551
21410BY	VEH WASH RACK		6 PER INST	6.0	126	90	9588	35	513	713	1261
21410GT	3600 SQ FT BUILDING GT WOOD		2 PER INST	2.0	2030	1762	151154	1073	8555	2790	12418
21410HN	VEHICLE MAINT FAC WD FR 6 BAY T/D		2 PER INST	2.0	2610	2234	183256	1154	9818	3109	14181
21411AA	LUB RACK, VEHICLE, 12X56 RAMP + PLATED		4 PER INST	4.0	28	20	3460		2088	348	2436
72321BD	LAT PIT TYPE 160-MAN 8-SEAT 10X20	10X20X8	1 PER INST	1.0	8	9	1559	3	290	46	339
81240HB	ELECTRICAL DISTRIBUTION SYS 250-MAN		AS REQUIRED	1.0	28	42	27991	3	33	3	39
84120FA	ELECTRICAL DISTRIBUTION SYS 250-MAN		AS REQUIRED	1.0	28	42	27991	3	33	3	39
84330AC	SUMP FIRE PROTECTION 10000 GAL	10000 GAL	AS REQUIRED	1.0	7	5	145	23	157	168	348
84330AE	FIREFHT EQPT POL W/10MGAL WTR&PUMP		AS REQUIRED	1.0	1	5	16777		49		49
85110DF	HARDSTAND, STAB SURF, 1000 SQ YD, 4 IN		AS REQUIRED	36.0	1512	1008	7560	1253		418	1671
187190AA	SITE PREPARATION, 1 ACRE		AS REQUIRED	8.3				1059		385	1444
87210AA	FENCE, CHAINLINK W/2 OUTRGRS 1	1000LF	AS REQUIRED	2.5	43	128	30185	453		1450	1903
87210AF	GATE, CHAINLINK SING/LEAF 3 WI 10 HI		AS REQUIRED	1.0	1	2	279	9		17	26
87210AL	GATE, VEH CHAINLINK 10 FT HI 32 F WI		AS REQUIRED	1.0	1	2	401	10		22	32
					7051	5820	501543	5078	23047	11612	39737

Figure 3-1. Example of an installation planning table

(3) Construction Material. The logistics and cost data associated with each facility. The weight, given in short tons (2,000 pounds) includes packing material. The shipping volume is given in measured tons (40 cubic feet per measured ton). Costs are current as of the date of issue and are based on the Stock Item Master File (SIMF).

(4) Construction Effort in Man-Hours. A list of the estimated engineer effort for horizontal, vertical, and general skills. The "total" column represents the sum of those items.

3-3. USE OF TM 5-302

a. General. TM 5-302 provides construction drawings to be used by military units in a TO. TM 5-302 contains installation layouts, facility plans, construction details, and lists of materials. The drawings consist of standard architectural/engineering working drawing elements. TM 5-302 is intended for use by:

(1) Base development planners determining facilities required to support Army functions.

(2) Engineer commands or units preparing and issuing construction drawings.

(3) Construction personnel acquiring materials and doing the actual construction.

(4) Supply personnel identifying and supplying construction materials.

b. Construction Drawings. Appendix F briefly describes how to use the construction drawings.

c. CPM Networks.

(1) Network analysis is a method of planning and controlling projects by recording the interdependence of operations in a diagrammatic form so that each basic problem can be solved separately. Some important advantages of network analysis are listed in paragraphs *(a)* through *(d)* below:

(a) Network analysis shows the interdependencies between jobs, and enables people to see the overall plan and how their own activities depend on or influence the activities of others. Setting out the complete plan for everyone involved in the project makes assessment easier and helps prevent unrealistic or superficial planning.

TM-5-301

TEMPERATE CLIMATE (1)

FACILITY NUMBER	DESCRIPTION (2)	CONSTRUCTION MATERIALS (3) WT SHT TONS	VOL MEAS TONS	COST $	CONSTRUCTION EFFORT IN MAN-HOURS (4) HOR	VERT	GENL	TOT
41180AG	TANK, POL, 3000 BARREL, W/6 IN PIPE + FITTINGS TO TANK BERM + BERM DRAIN ASSEMBLY	2	32	12,382	90	310	210	61
41180AH	TANK, POL, 3000 BARREL, W/8 IN PIPE + FITTINGS TO TANK BERM + BERM DRAIN ASSEMBLY	2	32	12,044	90	310	220	62
41180AJ	TANK, POL, 10000 BARREL, W/6 IN PIPE + FITTINGS TO TANK BERM + BERM DRAIN ASSEMBLY	2	40	20,700	140	850	420	1,41
41180AK	TANK, POL, 10000 BARREL, W/8 IN PIPE + FITTINGS TO TANK BERM + BERM DRAIN ASSEMBLY	3	40	20,115	140	850	430	1.42
41180AL	TANK, POL, 10000 BARREL, W/12 IN PIPE + FITTINGS TO TANK BERM + BERM DRAIN ASSEMBLY	3	40	26,397	145	850	435	1,43
41180AM	TANK, POL, 50000 BARREL, W/8 IN PIPE + FITTINGS TO TANK BERM + BERM DRAIN ASSEMBLY	4	193	52,847	300	4,430	2,000	6,74
41180AN	TANK, POL, 50000 BARREL, W/12 IN PIPE + FITTINGS TO TANK BERM + BERM DRAIN ASSEMBLY	4	193	60,934	300	4,440	2,000	6,74

Figure 3-2. Example of a facility planning table

(b) Resource and time constraints can be included in the plan before its evaluation. An example of a resource constraint would be several operations requiring a crane, but only one crane is available. An example of a time constraint would be a minimum delivery period for materials (such as long lead-time items).

(c) Stricter controls can be used, since any deviation from the schedule is noticed quickly.

(d) If the completion date must be advanced, attention can be concentrated on speeding up only the few critical jobs. Then resources are not wasted on speeding up noncritical jobs.

(2) Appendix G explains specific steps and details for developing and using CPM networks.

3-4. USE OF TM 5-303

TM 5-303 is generally used by planners, builders, and suppliers in order to identify facility construction materials. A portion of a typical page in TM 5-303 (see figure 3-3) contains the information listed in paragraphs *a* through *i* below, which coordinate with the circled letters in figure 3-3:

a. Facility Number. Five numeric and two alpha characters that identify each AFCS facility (e.g., 54010AW).

b. Building Description. Information about frame type, roofing and siding material, climatic zone, and dimensions.

c. Man-Hours. Construction estimate in vertical, general, and horizontal construction in terms of man-hours.

d. Materials. Logistical data, including shipping weight, volume, and costs.

e. BOM Section. Structural component breakdown.

f. NSN. A unique number, assigned by the Department of Defense (DOD), that identifies the item.

g. Item Description. A general description of an item.

h. Unit of Issue. The smallest quantity per issue, such as each, linear foot, pound, package, etc. (See section II of the glossary for abbreviations.)

i. Quantity. Amount of material required to construct the facility, including allowance for breakage, loss, and cutting to fit.

3-5. TACAPS USER GUIDE

a. The TACAPS User Guide explains how to use TACAPS effectively. The Huntsville Division TACAPS point of contact will provide system diskettes and specific user information upon request.

b. The user can install TACAPS on a personal computer by following the instructions provided with the diskettes and the specific user information contained in the TACAPS User Guide. User-friendly menus help the user access the facility and installation files in order to get current TM 5-301 and TM 5-303 information and use the tables of organization and equipment (TOE's)/facility base-camp planning module. Figure 3-4 shows an a sample of a TOE/facility computation.

c. The TOE/facility module enables the planner to develop specific base camps that are tailored to TOE organization requirements. The facility makeup for a

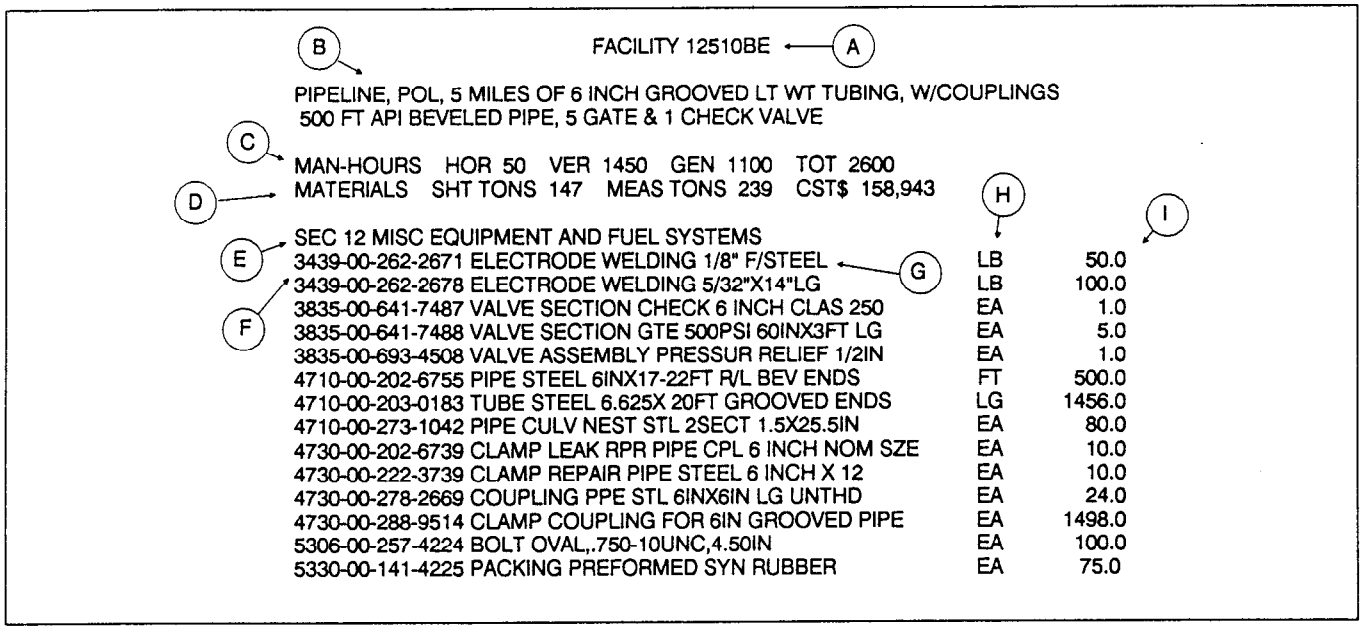

Figure 3-3. Typical TM 5-303 entry

BASE-CAMP CAMPX		TOTAL ENLISTED 00217	TOTAL OFFICER 00017
07178H010	CSC, INF BN, LT INF BDE	00104	00005
08147H000	MED CO, SEP AIM BDE, ACR	00113	00012

FACILITY	QUANTITY REQUIRED	RATE	QUANTITY ASSIGNED	INST CODE	UNIT OF MEASURE
COMPANY HQS BUILDING 14185	044249	07	00800	111	SQFT
COMM/ELECT MAINT SHOP 21710	000410	01	01000	111	SQFT
COLD STORAGE (UNIT) 43210	000108	02	00150	111	CUFT
COVERED STORAGE (UNIT) 44220	000006	02	00600	111	CUFT
TROOP HOUSING, ENLISTED 7211	015624	08	01872	111	SQFT

Figure 3-4. Example of a TOE

developed base camp is determined via computer by using DOD criteria for each construction category code (AR 415-16) and the personnel/equipment makeup of the selected TOE organizations as identified in the approved TOE master files. The computer results include equipment line item numbers, military occupational specialty numbers, and enlisted personnel and officer head count. The planner simply enters into the computer the standard requirements code or unit code and the quantities for all planned TOE units. All requirements are integrated into a single camp plan, and the camp list of quantities required at specific AFCS facilities can then be generated. The planner has the option of deleting, adding, or changing any facility on the list and producing the TM 5-301 or TM 5-303 items for the developed camp facilities.